Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the matter of	)	
	)	
Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum for Wind Profiler Radar Systems	)	ET Docket No. 93-59 RM-8092

COMMENTS
OF
METRICOM, INC.

Metricom, Inc. ("Metricom"), by its attorneys, pursuant to the invitation extended in the Notice of Inquiry issued in the above-referenced proceeding, hereby submits its comments concerning the allocation of additional frequency spectrum in the 902-928 MHz frequency band for wind profiler radar systems ("WPRS"). As discussed more fully below, Metricom firmly believes that the Commission should *not* allocate spectrum in the 902-928 MHz frequency band for WPRS because: harmful interference will be created from and to WPRS; such an allocation would be inconsistent with existing Commission policy; and, more appropriate "fixed" frequency bands for WPRS' operations may exist.

I. INTRODUCTION

1. Metricom is a young, rapidly growing, technologically innovative company based in Los Gatos, California. Metricom develops and manufactures various types of sophisticated radio frequency transmitter and receiver systems operating pursuant to

Part 15 of the Commission's Rules and Regulations. Metricom's frequency-hopping spread system systems are at the leading edge of technology. For example, Metricom's innovative mesh network architecture is the first license-free wireless solution to provide cost-effective, intelligent and flexible regional data communications for a variety of vertical market applications. Metricom wireless data communications networks have already been sold to 14 electric utilities including some of the largest in the country. Additionally in 1993, Metricom expects certain of these utilities to install production-class implementations of this communications network. Other networks have been or will be installed in 1993 by a major railroad, water treatment facilities and other industries.

2. Metricom is aware that there are presently several hundreds of application-specific products manufactured pursuant to Part 15, including digital cordless telephones, fire and security alarm devices, airborne collision avoidance radar, bar code readers, and many other point-to-point and point-to-multipoint devices. These products have been developed because of the Commission's encouragement of Part 15 devices. They have been designed in a robust fashion in order to avoid causing harmful interference to others, and to withstand harmful interference from others. Because of the potential for significant levels of harmful interference between WPRS and Part 15 devices resulting from Radian's proposal, Metricom applauds the Commission for not issuing a Notice of Proposed Rulemaking at this time. The Commission was

correct in proceeding with a Notice of Inquiry in this proceeding to obtain the requisite factual and policy information, particularly in view of the fact that Radian's Petition failed to elicit any support from any quarter.

II. METRICOM HAS STANDING TO CHALLENGE THIS PROPOSAL

3. The issue of standing in this proceeding was first raised by Radian Corporation ("Radian"). In response to oppositions by Part 15 operators to Radian's Petition for Rulemaking, Radian argued that Part 15 operators in the 902-928 MHz frequency band did not have "standing" to oppose the proposed frequency reallocation because Part 15 operators must accept interference from, and not cause interference to, licensed users. Several reasons exist why Radian's position is totally untenable. First, Radian is *proposing* a frequency allocation. Radian does not have any established "licensee" status in the 902-928 MHz frequency band where Part 15 devices are operating. It is only interference to and from established licensees in the band about which Part 15 operators may not complain.[1/] Second, because Part 15 operators have been *encouraged* by the Commission to develop and implement new spread spectrum technologies under Part 15,[2/] and in accordance with this Commission encouragement have invested (in Metricom's estimation)

[1/] See, Amendment of Parts 2 and 15 of the Rules With Regard to the Operation of Spread Spectrum Systems (Report and Order), 8 FCC Rcd 4123 (1990), ¶ 8.

[2/] Id.

approximately one billion dollars in these operations, Part 15 operators have developed substantial interests in the 902-928 MHz band which will be adversely impacted if the Commission implements Radian's proposal. Finally, it has been well established by the Commission that interested members of the public have standing to file comments on a proposal to allocate frequency spectrum. Part 15 operators certainly qualify as "interested members of the public" as far as the 902-928 MHz band is concerned. Therefore, there can be no question that Part 15 operators have standing to challenge the Radian proposal.

III. WPRS AS PROPOSED BY RADIAN WILL CAUSE INTERFERENCE TO, AND WILL RECEIVE INTERFERENCE FROM, PART 15 DEVICES

4. Radian's Petition states that its WPRS will operate with 500 watts of transmitter output power. Simply stated, this 500 watts (+57 dBm) of transmitter power is such a high level of radio frequency energy that any mitigation of interference from these transmissions would be extremely difficult.

5. Even though the antennas proposed by Radian are directional, side-lobe radiation is very significant given the 500 watts of transmitter power to be employed. Metricom believes that the use of side-lobe suppression fences, as proposed by Radian, will not alleviate this problem. The data provided by Radian

levels would be greater than 10 watts EIRP even near the horizon.[3/] Accordingly, Radian's WPRS could cause harmful interference to Part 15 devices within an approximate 25 mile radius of the WPRS,[4/] and these WPRS could be operating full time at many locations throughout the country.

6. Furthermore, for WPRS to operate with the resolution and range desired, the required receiver specifications necessitate extremely sensitive designs. While information has not been provided for Radian's 900 MHz WPRS, data can be extrapolated from the earlier 404 MHz systems which illustrates that the minimum detectable signal levels were on the order of -170 dBm.[5/] Receivers with such sensitive receive-signal levels can be easily interfered with, even by very low power, spread spectrum Part 15 operations in the 902-928 MHz band.

IV. ALLOCATING SPECTRUM AS PROPOSED BY RADIAN WOULD BE INCONSISTENT WITH REASONED DECISION-MAKING

7. Given the technical problems noted in Paragraphs 4-6 above, it follows that the Commission's past and continuing

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[3/] It should be noted that similar power levels are used by government radar systems, particularly the U.S. Navy, operating in the 900 MHz band. Generally, the Navy turns off these systems whenever ships are within 100 miles of shore so they will not cause interference to users of the 902-928 MHz spectrum.

[4/] This assumes that the Part 15 receiver sensitivity is -100 dBm, has an antenna gain of +3 dB, and can withstand up to 20 dB of interference level. This means a signal at -80 dBm at the Part 15 receiver would constitute harmful interference.

[5/] See Law, Daniel C., "Wind Profilers: Applications and Characteristics," QST, June 1992 (American Radio Relay League) p.49.

achievement of several policy goals dictates that the Commission should not grant Radian's Petition. These two policy goals are intertwined, and result directly from the Commission's encouragement of the development and implementation of Part 15 innovative technology.

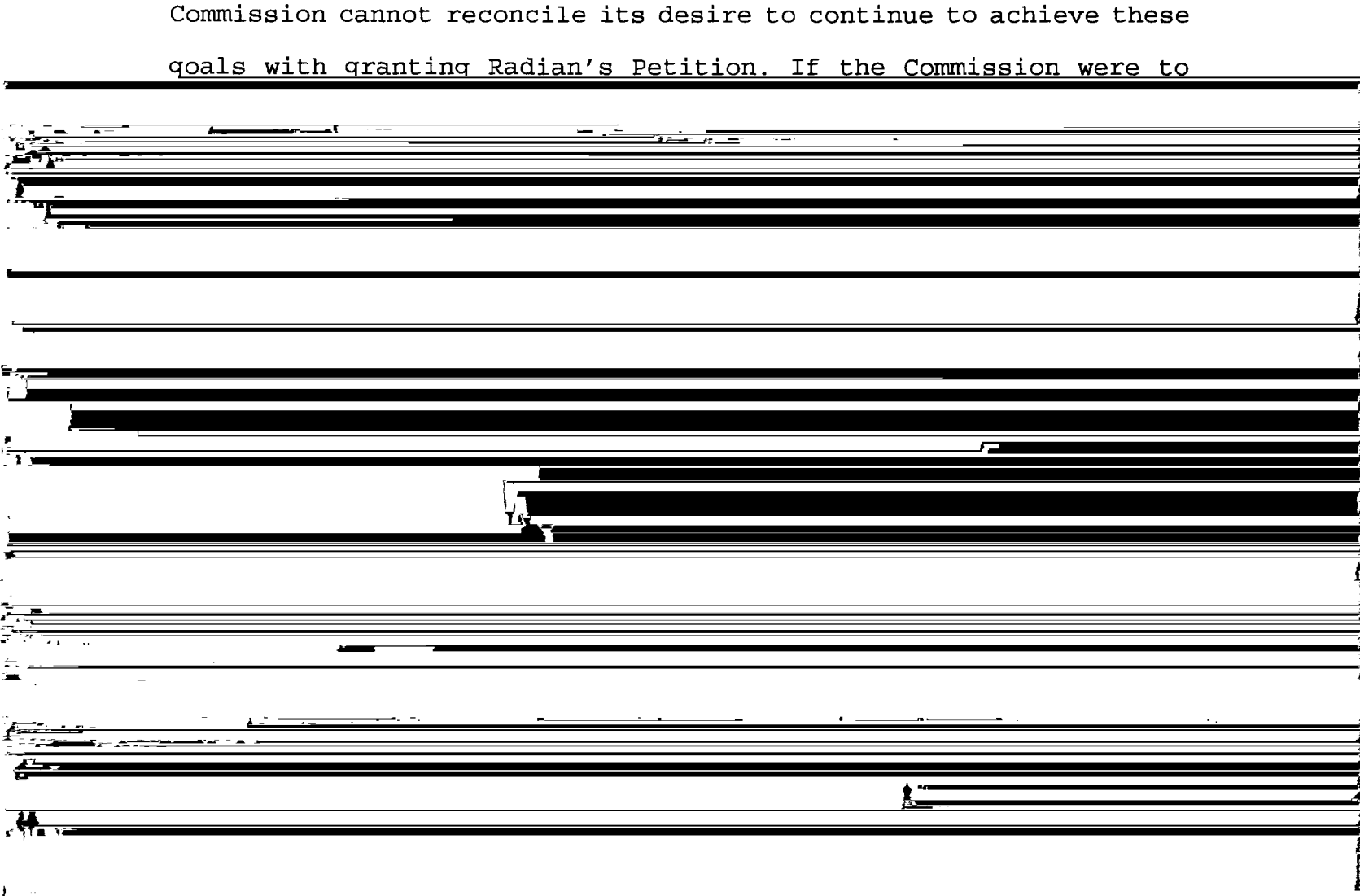
A. The Proposed Allocation is Inconsistent With Commission Actions Promoting and Encouraging Part 15

8. In its overall frequency allocation policies to promote the more effective and efficient uses of radio in the public interest, the Commission has recognized the importance of, and encouraged, Part 15 operations. In the recent past, the Commission has adopted rules "to facilitate greater flexibility in the design and use of low power, non-licensed spread spectrum systems,"[6/] because it believed that making the 902-928 MHz band available for Part 15 use would "provide major benefits to both manufacturers and consumers" and create an opportunity for "many new practical uses."[7/] Because the Commission believed that "Part 15 spread spectrum technologies offer important new opportunities for developing new short range communications capabilities ...." the Commission stated:

[6/] See, generally, Amendment of Parts 2 and 15 of the Rules With

> We desire to encourage the development and implementation of this exciting new family of technologies, and therefore seek to provide a regulatory framework in which there is maximum flexibility for the use of spread spectrum systems consistent with the basic precept of Part 15 rules that non-licensed operations are not to cause harmful interference to established services.[8/]

9. It is therefore obvious from Commission pronouncements and actions (such as adoption of the Part 15 Rules) that the Commission has been extremely interested in promoting innovation, development and wide-spread distribution and use of Part 15 devices in the 902-928 MHz frequency band. It is also obvious that Commission has achieved these goals and is continuing to expand its achievement of these goals on a daily basis as the development of Part 15 equipment in the 902-928 MHz band continues to expand. The Commission cannot reconcile its desire to continue to achieve these goals with granting Radian's Petition. If the Commission were to



encouraging and promoting Part 15 operations in the 902-928 MHz band.[9/]

B. The Commission Would Be Unable To "Police" Interference To WPRS From Consumer Equipment

10. As noted above, the Commission has achieved the wide-spread proliferation of Part 15 devices (in the 902-928 MHz band) into the hands of consumers. Furthermore, the utilization of such equipment is expected to expand exponentially in the very near future. Cordless digital phones operating with up to one watt of power, offering better quality, more range and privacy, provide an excellent example of new products which will soon be in the marketplace and operated by consumers.

11. The operation of Part 15 equipment by millions of unlicensed consumers in businesses and homes throughout the

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[9/] In PR Docket No. 93-61 (Notice of Proposed Rulemaking, FCC 93-141, rel. April 9, 1993) the 902-928 MHz frequency band

country, who are not used to dealing with the FCC, will cause an enormous enforcement problem for the Commission when the Part 15 equipment causes harmful interference to WPRS. It may be completely infeasible for the Commission to enforce orders directing the termination of the use of Part 15 equipment, especially given the significant numbers of this equipment currently in consumers' hands and the vast sums invested by these consumers in such equipment.[10/] Therefore, if the Commission were to grant Radian's Petition, the Commission would not only be creating a situation in which the Commission would be unable to control the widespread and massive interference to WPRS receivers, but also a situation directly at odds with the Commission's desire to encourage consumer investment in, and use of, Part 15 equipment.

V. THE COMMISSION SHOULD CONSIDER ALLOCATING SPECTRUM IN A FIXED SERVICE FOR WPRS

12. The characteristics of WPRS operations indicate that they are well suited to operate in a fixed band. WPRS are not intended to be used while in motion, and although there may be some transportable use, the actual use will be fixed, at a precise location. Therefore, it would appear that the operation of these systems at fixed locations could be easily coordinated in accordance with existing coordination rules and regulations in

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[10/] The other side of this coin is WPRS causing interference to Part 15 equipment; the Commission can count on there being a huge public outcry (including from Members of Congress) relating to the poor performance -- because of WPRS interference -- of potentially millions of Part 15 devices in homes and offices.

specific bands.[11/] In this manner, WPRS would be protected from harmful interference at specific locations and would not cause interference to other fixed operations in the same frequency band.

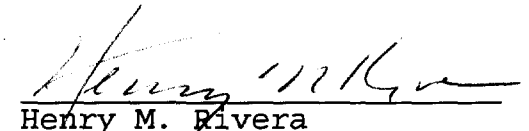
VI. CONCLUSION

13. For all of the foregoing factual and policy reasons, the Commission should not issue a Notice of Proposed Rulemaking in this proceeding. Metricom believes that any further action in this proceeding would amount to an inefficient use of the Commission's already limited resources, especially in these times of fiscal austerity in the Federal Government.

WHEREFORE, THE PREMISES CONSIDERED, Radian's Petition For Rulemaking should be dismissed.

Respectfully submitted,

METRICOM, INC.

By: 

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[11/] See, e.g., § 94.63, "Interference Protection Criteria For Operational Fixed Stations."